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EX PARTE OR LATE FILED

December 26, 2002

VIA HAND DELIVERY

Marlene H. Dortch, **Esq.**
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band and the 1.6/2.4 GHz Band, IB Docket No. 01-185

EX PARTE

Dear Ms. Dortch:

The Catholic Television Network ("CTN") and the National lTFS Association ("NIA"), by their respective attorneys, hereby request consideration of this letter on an **ex *parte*** basis in the above-referenced proceeding. Recent press reports indicate that a decision may be imminent that would, among other things, permit mobile satellite licensees in the 1610-162632483-2500 MHz band (the "Big LEO Band) to provide an ancillary terrestrial component ("ATC") in that band.[1] CTN and NIA wish to remind the Commission of the urgent need to protect ITFS operations in the adjacent 2500 MHz band through appropriate technical rules if ATC is permitted in any form.

Both CTN and NIA filed reply comments in this proceeding identifying the potential for interference between ATC in the Big LEO Band and ITFS operations in the adjacent 2500 MHz band.[2] The interference potential arises because the lTFS band at 2500-2690 MHz, is immediately adjacent to the Big LEO Band at 2483-2500 MHz. CTN and NIA identified three distinct interference threats: (i) adjacent-channel interference caused when the undesired signal from an ATC transmitter exceeds the desired signal from an lTFS transmitter at an ITFS receiver; (ii) brute-force overload when an **ATC** transmitter operated near an **ITFS** receive site overwhelms the initial stage of the receiver; and (iii) interference with sensitive receive "hubs" designed to collect the signals from two-way subscriber devices operating in the ITFS band.

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1 ***See, e.g., Communications Daily,*** December 18, 2002, at ***6.***

2 ***See*** Reply Comments of CTN in IB Docket No. 01-185 (Nov. 13,2001); Reply Comments of NIA in IB Docket No. 01-185 (Nov. 13,2001) (copies attached as Exhibits 1 and 2).

These interference threats still exist, and the prevention of interference remains an absolute requirement of any authorization of ATC in the Big LEO Bands. An updated engineering statement describing the potential for ATC to interfere with ITFS operations is attached as Exhibit 3 to this letter. ITFS systems are licensed in nearly all areas of the country, according to a study recently performed by the Commission.[3] These systems, whose core mission is delivering educational materials to students, must be protected from ATC operations in the adjacent band.

The need for protection of ITFS facilities is made even more urgent by the plans to revise the regulatory regime governing the ITFS and MDS bands. Pursuant to a revised band plan submitted by the CTN, NIA and the Wireless Communications Association International ("WCA"),[4] the portion of the ITFS band that is adjacent to the Big LEO Band would be set aside for low-power two-way cellularized communications...[5] In a recent *ex parte* letter in this proceeding, the WCA described the specific interference concerns that arise when such cellularized systems propose to operate on adjacent bands in the same geographic area.[6] Such inter-system interference between ATC and cellularized ITFS/MDS is very likely to arise given that both types of systems are likely to be deployed in the largest metropolitan areas in the country.

The proponents of ATC have generally paid no more than lip service to the need to protect adjacent ITFS operations? The Commission has the clear duty to ensure that its spectrum allocations do not interfere with one another. Accordingly, the Commission should authorize ATC in the Big LEO Band, if at all, only with accompanying technical rules to protect existing and planned ITFS operations in the adjacent 2500 MHz band.

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3 Spectrum Study of the 2500-2690 MHz Band – the Potential for Accommodating Third-Generation Mobile Systems, Final Report at 42-44 (Mar. 30,2001).

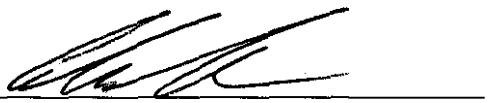
4 *See* Wireless Telecommunications Bureau Seeks Comment on Proposal to Revise Multichannel Multipoint Distribution Service and the Instructional Television Fixed Service Rules (RM-10586), *Public Notice,* DA 02-2732 (rel. Oct. 17, 2002).

5 Letter from Paul J. Sinderbrand, counsel to WCA, to Marlene H. Dortch, Secretary at 2 (Dec. 18, 2002).

6 *Id.* at 3-4.

7 *See id.* at 4 and n.11.

Respectfully submitted



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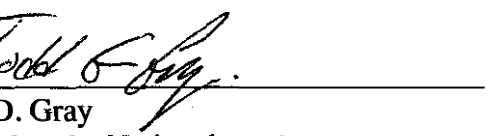

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STAMP & RETURN

EXHIBIT 1

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Band	)	IB Docket No. 01-185
	)	
Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum at 2 GHz for User by the Mobile Satellite Service	)	ET Docket No. 95-18

REPLY COMMENTS OF
THE CATHOLIC TELEVISION NETWORK

The Catholic Television Network ("CTN), by its counsel, hereby submits its reply comments in the above-captioned proceeding. These reply comments address one important aspect of the proposals before the Commission to add flexibility to the delivery of mobile satellite service ("MSS") communications: the need to protect Instructional Television Fixed Service **("ITFS")** operations in the 2500-2690 MHz band.

I. BACKGROUND

CTN is an association of Roman Catholic archdioceses and dioceses that operate many of the largest parochial school systems in the United States. CTN's members use ITFS frequencies to distribute educational, instructional, inspirational, and other services to schools, colleges, parishes, community centers, hospitals, nursing homes, residences, and other locations throughout the United States. In addition, some CTN members lease a portion of their ITFS spectrum capacity to commercial Multipoint Distribution Service providers who use the channels for broadband and other commercial services.

Pursuant to recent rule changes, fixed transmitters located at subscriber premises may also communicate on ITFS channels with centrally located response station "hubs."[7] While the standard 0 dB D/U ratio still must be maintained between adjacent channels, complex new rules provide the methodology for calculating the combined signal strength of subscriber transceivers operating on an adjacent channel.[8] Moreover, the extreme sensitivity of response station hubs requires that they be afforded special protections from co- and adjacent-channel transmissions originating as far as 100 miles away.[9] Two-way systems must be carefully engineered to control interference, both within a single system and between systems deployed in nearby market areas Even so, if actual interference occurs, the licensee of the offending transmitter must cure the interference or cease operations."[10]

The potential for a subscriber transceiver to be located near a sensitive ITFS receive site also creates the possibility **of** "brute-force overload," a condition in which excess radiofrequency energy overwhelms the initial stages of the ITFS receiver electronics. Because brute-force overload occurs in the early stages of the receiver, it hampers the receiver's ability to filter out the undesired signals **through** frequency discrimination. Thus, a transmitter has the ability to cause brute-force overload in a nearby receiver even when the transmitter and receiver operate on widely separated frequencies. The **ITFS** rules contain several provisions for the protection of ITFS receive sites from brute-force overload.[11]

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7 ***See generally Amendment of Parts 21 and 74 to Enable Multipoint Distribution Service and Instructional Television Fixed Service Licensees to Engage in Fixed Two-Way Transmissions, Report and Order,*** 13 FCC Rcd 19112 (1998), ***recon.,*** 14 FCC Rcd 12764 (1999), ***further recon.,*** FCC 00-244 (rel. July 21, 2000) ***("Two-Way Order").***

8 ***See*** Appendix ***D*** to ***Two-Way Order.***

9 ***See*** 47 C.F.R. § 74.939(i).

10 ***See*** 47 C.F.R. § 74.939(g)(7).

11 ***See*** 47 C.F.R. § 74.939(g)(8); 74.939(p).

B. Interference to ITFS From ATC in the 2.4 GHz Band

With the foregoing in mind, at least four different interference threats to ITFS from terrestrial operation in the Big LEO band can be identified. First, terrestrial transmitters operating in the Big LEO band just below 2500 MHz have just the same potential to cause adjacent channel interference to ITFS facilities operating on Channel A1 (2500-2506 MHz) as do ITFS transmitters operating on adjacent Channel B1 (2506-2512 MHz). To illustrate the problem, the attached Engineering Statement analyzes the effect of a terrestrial Big LEO base station transmitter operating on the frequencies adjacent to Channel A1 on a typical ITFS receive site or subscriber location within the protected service area of an ITFS transmitter on Channel **A1.** Using worst-case assumptions (a Big LEO base station operating at maximum power oriented towards an ITFS receive antenna near the limit of an ITFS 35-mile protected service area), the base station would cause interference to the ITFS receiver if it were anywhere within 14 kilometers **of** the receive site." Using best-case assumptions (base station oriented towards the back lobe of the ITFS receive antenna where its sensitivity is lowest), adjacent channel interference would still be caused if the base station were up to 0.79 kilometers away.

Second, a terrestrial transmitter operating ***anywhere*** in the 2.4 GHz Big LEO band has the potential to cause brute-force overload in a nearby ITFS receiver. The Engineering Statement also analyzes a typical situation that could give rise to this phenomenon. A Big LEO base station within 5,000 feet of an ITFS receive site can cause brute-force overload in the ITFS receiver if they are co-aligned.[13] **If** the base station is located behind the receiver, the distance reduces to 282 feet.

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12 Engineering Statement, ¶ 3.

13 ***Id.,*** ¶ 4.

Third, a terrestrial base station transmitter in the **2.4** GHz Big LEO band can interfere with the operation of a response station hub in a two-way system that uses Channel A1 for a return path. These highly sensitive receivers are generally omnidirectional and elevated, to receive response signals from any transceiver in the response service area. A hub could be equipped with **2.4** GHz filters to mitigate interference from a Big LEO base station, but there would have to be coordination between the licensees to implement any mitigation measures.[14]

Finally, if ***mobile*** transmitters are allowed to operate in the **2.4** GHz Big LEO band, it may be impossible to control the transient interference that will occur whenever a mobile handset is operated near an ITFS receiver.[15] For example, if a teacher is using ITFS to deliver instructional material to a classroom, the operation of an MSS handset in the **2.4** GHz band in the school building or nearby could temporarily prevent reception of the video material, disrupting the lesson plan.

The likelihood that actual interference will arise from one or more of these threats if terrestrial operations are authorized in the frequencies immediately adjacent to the ITFS band is high, because MSS operators intend to deploy terrestrial operations in urban areas, where ITFS systems are most densely deployed.[16] For this reason, CTN urges the Commission to proceed carefully with the authorization of ATC in the **2.4** GHz Big LEO band, and to do so only if appropriate technical rules are adopted that protect ITFS operations.

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14 ***Id.,*** ¶ **5.**

15 Although the parties have not set forth specific band plans for the Big LEO bands, the fact that the satellite downlink band at **2.4** GHz is under consideration for mobile terrestrial handset transmissions can be inferred from the comments. ***See,*** *e.g.*, Comments of Constellation at **36** n.78; ***Notice*** at ¶¶ **60-62.**

16 ***See*** Comments of Constellation at **2;** Comments of Globalstar at **3-4; *Notice*** at ¶ 10.

C. RECOMMENDATIONS

The technical rules for **MSS** operation in the **2.4 GHz** Big LEO band should include, at a minimum, a requirement that no mobile operations be permitted within **6 MHz** of ITFS Channel **A1.** This will ensure that ITFS receivers will be able to reject transient interference from mobile transmitters that are operated near receive sites, subscriber antennas, or response station hubs. Second, any fixed transmitters operating within 6 MHz of Channel **A1** should be individually licensed, and should be subject to the same requirements for the protection of adjacent-channel ITFS facilities **as** ITFS fixed transmitters. Third, the licensee of any transmitter in the **2.4 GHz** Big LEO band should be responsible for curing any actual interference caused to ITFS facilities, including brute-force overload interference, or must immediately cease operation of the offending transmitter until the interference can be mitigated.

Respectfully submitted,

CATHOLIC TELEVISION NETWORK

By: _____

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Its attorneys

November **12,2001**

Engineering Statement of Dane E. Ericksen, P.E.

The firm of Hammett & Edison, Inc. has been retained on behalf of the Catholic Television Network ("CTN), representing numerous Instructional Television Fixed Service ("ITFS") stations licensed to, and operated by Roman Catholic Archdioceses and Dioceses throughout the United States, in support of CTN reply comments to IB Docket 01-185 concerning an ancillary terrestrial component for the Mobile Satellite Service.

An ATC for Big LEO Poses Adjacent Channel and BFO Interference Threats To ITFS

1. The comments of Constellations Communications Holdings, Inc. ("Constellation") and the combined comments of Globalstar, L.P. and L/Q Licensee, Inc. ("Globalstar/LQL") both support an ancillary terrestrial component ("ATC') for "Big LEO" Mobile Satellite Service ("MSS") operations at 2,483.5–2,500 MHz. This band is presently used for space-to-Earth downlinking, but if an ATC were to be allowed then terrestrial base stations transmitting in this band would create both an adjacent channel interference threat to Instructional Television Fixed Service ("ITFS") stations operating on Channel A1 (2,500–2,506 MHz), and also a brute-force overload ("BFO") interference threat to receive sites anywhere in the 2,500–2,686 MHz ITFS band.

2. Although both the Constellation and Globalstar/LQL comments *are* unspecific on the exact technical details of an ATC for Big LEO MSS, several reasonable assumptions can be made. For starters, one can assume a maximum permissible EIRP for an ITFS station, which can be as high as 69 dBm if a directional transmitting antenna is used, pursuant to Section 74.935(b) of the FCC Rules. One can also assume a hypothetical receive site at the edge of a 35-mile (56.3-kilometer) radius protected service area ("PSA") with a free-space path loss ("FSPL") of 135.4 dB, and the FCC-specified 2-foot diameter reference receiving antenna with a gain of 20 dBi. If one further assumes a 0.5 dB jumper cable loss between the receiving antenna and the downconverter input, the receive carrier level ("RCL") of the desired Channel A1 ITFS signal can be calculated to be -46.9 dBm. Alternatively, one could assume an omnidirectional ITFS station with a maximum EIRP **of** 63.0 dBm, and a hypothetical receive site in the middle **of** the station's 35-mile PSA (*i.e.*, 17.5 miles from its associated transmitter); this again results in a RCL of -46.9 dBm.

3. Section 24.132 of the FCC Rules specifies that narrowband Personal Communication Services ("PCS") base stations can have an equivalent isotropic radiated power ("EIRP) of up to 65.4 dBm, and Section 24.232 of the FCC Rules specifies that broadband PCS base stations can have an EIRP of up to 62.1 dBm. However, because Table 4 of Appendix B of the March 8, 2001,

New ICO letter that triggered this rulemaking proposed a maximum base station EIRP of 57 dBm, that lower EIRP limit will be assumed in these calculations as also applying to 2.4-GHz Big LEO ATC stations. For free-space conditions and assuming an **ITFS** receive antenna that is oriented towards its transmitter is also oriented towards a 57.0 dBm EIRP Big LEO ATC base station, the closest distance that such a base station could be to a PSA-perimeter ITFS receive site and ensure a 0 dB D/U ratio is 14.0 kilometers (*i.e.*, corresponding to a FSPL of 123.4 dB). And even if one assumes the best possible orientation of the ITFS receive dish with respect to a 57.0 dBm EIRP terrestrial Big LEO base station, namely the case where the undesired signal from the Big LEO base station is in the back lobe of the ITFS receiving antenna and the receiving antenna therefore provides a rejection of 25 dB (per Figure I, Section 74.937(a) of the FCC Rules), thus reducing the necessary FSPL to 98.4 dB, the keep-away distance is still 0.79 kilometers, or more than 2,500 feet.

4. In the January 8, 1998, CTN comments to MM Docket 97-217 rulemaking ("digital, two-way, cellularized ITFS operations"), a RCL of -28 dBm was assumed as the signal level at which a conventional ITFS downconverter would be likely to experience brute force overload; based on that signal level, a BFO threat distance of 1,960 feet was derived. At Paragraph 55 of the resulting September 25, 1998, Report & Order ("R&O") to MM Docket, the Commission adopted this BFO threat distance, which now appears in Section 21.909(n) of the FCC Rules governing Multichannel Multipoint Distribution Service ("MMDS") stations and in Section 74.939(p) of the FCC Rules governing ITFS stations. For a 57 dBm EIRP Big LEO terrestrial base station, a mid-band (2,593 MHz) ITFS receive site using the 2-foot 20 dBi gain reference receiving antenna, a BFO threat distance of 1.54 kilometers, or more than 5,000 feet, can be derived if one assumes no receiving antenna discrimination. If one assumes the maximum rejection for the FCC 2-foot reference antenna of 25 dB, the BFO threat distance decreases to approximately 282 feet, but this still represents an area subject to BFO threat of about 250,000 square feet. And, of course, there is no guarantee that the relative geometries between an ITFS receive site and a Big LEO terrestrial base station would be so favorable. It should also be noted that no allowance for cross polarization would be appropriate, because ITFS and MMDS stations in the same area are typically cross polarized to each other in order to reduce interference; thus, a Big LEO terrestrial base station could always be expected to be parallel-polarized to roughly half of the ITFS or MMDS operations in a given area.

5. The response hubs adopted in the MM Docket 97-217 rulemaking, designed to receive communications for low-power upstream transmitters, would similarly need to be protected against adjacent-channel and BFO interference. However, for a fixed response hub, which would be far

fewer in number than conventional ITFS receive sites, it might be feasible to use special BFO-tolerant downconverters, ITFS bandpass filters, 2.4 GHz Big LEO band reject filters, **or** a combination of these mitigation measures, but, contrary to the comments of Constellation, which desires only "minimal technical rules" limiting an ATC for Big LEOs at 2.4 GHz, technical protection rules comparable to those adopted in the MM Docket 97-217 rulemaking will likely be necessary to ensure no interference to ITFS (or MMDS).

6. Just as the Constellation comments raise the concept **of** an "exclusion zone" to protect 1.6 GHz radio astronomy sites, terrestrial Big LEO base stations operating at 2.4 GHz will similarly need to adhere to exclusion zones defined by the PSAs of ITFS stations, since ITFS stations are no longer allowed to have discrete receive sites protected or licensed, but rather receive their protection on a PSA basis. Indeed, these calculations show that the PSA exclusion zone needs to be 35.5 miles for Channel A1 ITFS stations (*i.e.*, **35** miles plus 2,500 feet), and needs to be 35.1 miles **(Le.,** 35 miles plus approximately 282 feet) **for** BFO purposes, that is, applying to ITFS stations on all other ITFS channels besides Channel AI.

7. Thus, contrary to the statement made at Page 9 of the Globalstar/LQL comments, that "interference into services adjacent to the Big LEO bands is unlikely," there is indeed a threat **of** both adjacent-channel and BFO interference to ITFS receive sites. Since ITFS receive sites are clustered around urbanized areas, the very same urbanized areas where **MSS** wants **to** build an ATC, the threat **of** interference is even more likely.

Summary

8. An ATC for Big LEO MSS at 2,483.5–2,500 MHz represents an adjacent-channel interference threat to Channel A1 ITFS stations if Big LEO terrestrial base stations operate within 6 MHz of the upper band edge, and represents a BFO interference threat to all ITFS receive sites, regardless of where in the 2.4 GHz Big LEO band those stations might operate.

Dane E. Ericksen, P.E.
Hammett & Edison, Inc.
Consulting Engineers

REGISTERED PROFESSIONAL ENGINEER
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No. 11654
Exp. 9-30-04
ELECTRICAL
STATE OF CALIFORNIA

November 9,2001

EXHIBIT 2

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Flexibility for Delivery	)	IB Docket No. 01-185
of Communications by	)	
Mobile Satellite Service Providers	)	
in the 2 GHz Band, the L-Band and the	)	
1.6/2.4 GHz Band	)	
	)	
Atnendment of Section **2.106** of the	)	ET Docket No. 95-18
Commission's Rules to Allocate	)	
Spectrum at **2** GHz for Use by	)	
the Mobile Satellite Service	)	

To: The Commission

REPLY COMMENTS OF THE NATIONAL. ITFS ASSOCIATION

The National ITFS Association ("NIA") submits these reply comments in the referenced proceeding initiated by *Notice of Proposed Rule Making*, FCC 01-225 (released August 17, 2001) ("NPRM"). In the NPRM, the Commission explores the possibility of giving Mobile Satellite Service ("MSS") licensees additional flexibility to provide their services to the public through the operation of terrestrial facilities in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Band.

National ITFS Association

The National ITFS Association, established in 1978, is a non-profit, professional organization of ITFS licensees, applicants and others interested in the Instructional Television Fixed Service. The goals of NIA *are* to gather and exchange information about ITFS, to act **as** a conduit for those seeking information or assistance about ITFS, and to represent the interests of

ITFS licensees and applicants. **NIA** and its members have participated in virtually every FCC proceeding affecting ITFS. It has an interest in this proceeding, which considers technical changes potentially having adverse interference effects on ITFS licensees.

Potential for Interference to ITFS Stations

Two principal proponents of flexibility for MSS licensees filed comments in this proceeding: Globalstar L.P. and L/Q Licensee, Inc. ("Globalstar) and Constellation Communications Holdings, Inc. ("Constellation"). Each supports the FCC's prompt approval of ancillary terrestrial facilities in each of the MSS frequency bands, including the Big LEO downlink band at **2483.5-2500** MHz, which is immediately adjacent to the lower end of the ITFS band (ITFS Channel A1 being **2500-2506** MHz). Neither proponent, however, adequately addresses the obvious potential for interference to ITFS operations.

Globalstar's Comments, at p.9, states that interference into services adjacent to the Big LEO bands is unlikely. However, Globalstar discusses only potential interference to the Radio Astronomy Service and the Global Positioning System. Globalstar does not even acknowledge, much less address, the fact that the band is immediately adjacent to ITFS Channel A1.

Constellation's Comments, at p. **37,** concedes that some limits on transmit powers, antenna heights and out-of-band emissions may be needed to protect facilities operated in bands adjacent to MSS allocations. It goes on to suggest that technical standards should be the same as those applied in the adjacent allocations, thereby to provide the same level ofprotection from ancillary MSS base stations to adjacent band operations, **as** is afforded to the MSS ancillary facilities from facilities in adjacent bands. However, Constellation does not specifically address the potential interference to ITFS Channel A1 or the specific technical standards that would be necessary to protect ITFS Channel A1. Nor does it explain why its reciprocity approach is

appropriate in these circumstances, where a potential new use (MSS ancillary terrestrial facilities) is placed next to an existing, protected use (ITFS).

Discussion

NIA believes that the comments by Globalstar and Constellation do not adequately address the problem of interference to ITFS operations from a shift in the use of the Big LEO 2483.5 –2500 MHz band from satellite transmissions to terrestrial transmissions, including high power transmissions from locations that may be very near to ITFS receive sites or two-way hubs. Thus, at this point, there is no adequate legal or technical basis for the FCC to authorize ancillary terrestrial facilities in the 2483.5 – 2500 MHz band.

NIA has reviewed the comments being filed simultaneously by the Catholic Television Network ("CTN"), including the associated engineering statement by its consulting engineer, Hammett & Edison, Inc. NIA fully concurs with, and supports, CTN's comments for the reasons stated therein.

Conclusion

For these reasons, the FCC should not authorize ancillary terrestrial facilities in the Big LEO 2483.5 – 2500 MHz, at least not until the problem of interference to ITFS operations in the adjacent band is satisfactorily solved.

Respectfully submitted,

NATIONAL ITFS ASSOCIATION

By: Patrick J. Gossman, Ph.D.
Its Chair

NIA Counsel:
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November 13,2001

CERTIFICATE OF SERVICE

I hereby certify that **a** copy of the foregoing Reply Comments of National ITFS Association **was** mailed this 13th day of November, 2001 to the following:

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Engineering Statement of Dane E. Ericksen, P.E.

The firm of Hammett & Edison, Inc. has been retained on behalf of the Catholic Television Network ("CTN"), representing numerous Instructional Television Fixed Service ("ITFS") stations licensed to, and operated by Roman Catholic Archdioceses and Dioceses throughout the United States, in support of CTN ***ex parte*** comments to IB Docket 01-185 concerning an ancillary terrestrial component ("ATC") for the Mobile Satellite Service ("MSS").

Terrestrial Use of 2,48352,500 MHz for MSS Continues to Constitute an Interference Threat to ITFS Operations at 2,500–2,586 MHz

1. The comments of Constellations Communications Holdings, Inc. ("Constellation") and the combined comments of Globalstar, L.P. and L/Q Licensee, Inc. ("Globalstar/LQL") both support an ancillary terrestrial component ("ATC") for "Big LEO" Mobile Satellite Service ("MSS") operations at 2,483.5–2,500 MHz. This band is presently used for space-to-Earth downlinking, but if an ATC were to be allowed then terrestrial base stations transmitting in this band would create both an adjacent channel interference threat to Instructional Television Fixed Service ("ITFS") stations operating on Channel A1 (2,500–2,506 MHz), and also a brute-force overload ("BFO") interference threat to receive sites throughout the 2,500–2,686 MHz ITFS band.

2. Although both the Constellation and Globalstar/LQL comments are unspecific on the exact technical details of an ATC for Big LEO MSS, several reasonable assumptions can be made. For starters, one can assume a maximum permissible EIRP for an ITFS station, which can be as high as 69 dBm if a directional transmitting antenna **is** used, pursuant to Section 74.935(b) of the FCC Rules. One can also assume a hypothetical receive site at the edge of a 35-mile (56.3-kilometer) radius protected service area ("PSA") with a free-space path loss ("FSPL") of 135.4 dB, and the FCC-specified 2-foot diameter reference receiving antenna with a gain of 20 dBi. If one further assumes a 0.5 dB jumper cable loss between the receiving antenna and the downconverter input, the receive carrier level ("RCL") of the desired Channel A1 ITFS signal can be calculated to be -46.9 dBm. Alternatively, one could assume an omnidirectional ITFS station with a maximum EIRF' of 63.0 dBm, and a hypothetical receive site in the middle of the station's 35-mile PSA (*i.e.*, 17.5 miles from its associated transmitter); this again results in a RCL of -46.9 dBm.

3. Section 24.132 of the FCC Rules specifies that narrowband Personal Communication Services ("PCS") base stations can have an equivalent isotropic radiated power ("EIRP") of up to 65.4 dBm, and Section 24.232 of the FCC Rules specifies that broadband PCS base stations can have an EIRP of up to 62.1 dBm. However, because Table 4 of Appendix B of the March 8,2001, New ICO letter that triggered this rulemaking proposed a maximum base station EIRF' of 57 dBm, that lower EIRF' limit

will be assumed in these calculations as also applying to 2.4-GHz Big LEO ATC stations. For free-space conditions and assuming an ITFS receive antenna that is oriented towards its transmitter is also oriented towards a 57.0 dBm EIRP Big LEO ATC base station, the closest distance that such a base station could be to a PSA-perimeter ITFS receive site and ensure a 0 dB D/U ratio is 14.0 kilometers (*i.e.*, corresponding to a FSPL of 123.4 dB). And even if one assumes the best possible orientation of the ITFS receive dish with respect to a 57.0 dBm EIRP terrestrial Big LEO base station, namely the case where the undesired signal from the Big LEO base station is in the back lobe of the ITFS receiving antenna and the receiving antenna therefore provides a rejection of 25 dB (per Figure I, Section 74.937(a) of the FCC Rules), thus reducing the necessary FSPL to 98.4 dB, the keep-away distance is still 0.79 kilometers, or more than 2,500 feet.

4. In the January 8, 1998, CTN comments to MM Docket 97-217 rulemaking ("digital, two-way, cellularized ITFS operations"), a RCL of -28 dBm was assumed as the signal level at which a conventional ITFS downconverter would be likely to experience brute force overload; based on that signal level, a BFO threat distance of 1,960 feet was derived. At Paragraph 55 of the resulting September 25, 1998, Report & Order ("R&O") to MM Docket, the Commission adopted this BFO threat distance, which now appears in Section 21.909(n) of the FCC Rules governing Multichannel Multipoint Distribution Service ("MMDS") stations and in Section 74.939(p) of the FCC Rules governing ITFS stations. For a 57 dBm EIRP Big LEO terrestrial base station, a mid-band (2,593 MHz) ITFS receive site using the 2-foot 20 dBi gain reference receiving antenna, a BFO threat distance of 1.54 kilometers, or more than 5,000 feet, can be derived if one assumes no receiving antenna discrimination. If one assumes the maximum rejection for the FCC 2-foot reference antenna of 25 dB, the BFO threat distance decreases to approximately 282 feet, but this still represents an area subject to BFO threat of about 250,000 square feet. And, of course, there is no guarantee that the relative geometries between an ITFS receive site and a Big LEO terrestrial base station would be so favorable. It should also be noted that no allowance for cross polarization would **be** appropriate, because ITFS and MMDS stations in the same area are typically cross polarized to each other in order to reduce interference; thus, a Big LEO terrestrial base station could always be expected to be parallel-polarized to roughly half of the ITFS or MMDS operations in a given area.

5. The response hubs adopted in the MM Docket 97-217 rulemakmg, designed to receive communications for low-power upstream transmitters, would similarly need to be protected against adjacent-channel and BFO interference. However, for a fixed response hub, which would be far fewer in number than conventional ITFS receive sites, it might be feasible to use special BFO-tolerant downconverters, ITFS bandpass filters, 2.4 GHz Big LEO band reject filters, or a combination of these mitigation measures, but, contrary to the comments of Constellation, which desires only "minimal

technical rules" limiting an ATC for Big LEOs at 2.4 GHz, technical protection rules comparable to those adopted in the MM Docket 97-217 rulemaking will likely be necessary to ensure no interference to ITFS (or MMDS).

6. Just as the Constellation comments raise the concept of an "exclusion zone" to protect 1.6 GHz radio astronomy sites, terrestrial Big LEO base stations operating at 2.4 GHz will similarly need to adhere to exclusion zones defined by the PSAs of ITFS stations, since ITFS stations are no longer allowed to have discrete receive sites protected or licensed, but rather receive their protection on a PSA basis. Indeed, these calculations show that the PSA exclusion zone needs to be 35.5 miles for Channel A1 ITFS stations (*i.e.*, 35 miles plus 2,500 feet), and needs to be 35.1 miles (*i.e.*, 35 miles plus approximately 282 feet) for BFO purposes, that is, applying to ITFS stations on all other ITFS channels besides Channel A1.

7. Thus, contrary to the statement made at Page 9 of the Globalstar/LQL comments, that "interference into services adjacent to the Big LEO bands is unlikely," there is indeed a threat of both adjacent-channel and BFO interference to ITFS receive sites. Since ITFS receive sites are clustered around urbanized areas, the very same urbanized areas where MSS wants to build an ATC, the threat of interference is even more likely.

Any Use of 2,483.5–2,500 MHz for Terrestrial MSS Must Also Protect the Refarmed Operations Proposed in RM-10586 for the 2,500–2,690 MHz Band

8. On November 13, 2001, CTN filed reply comments to IB Docket 01-185, pointing out that terrestrial MSS operations at 2,483.5–2,500 represent an interference threat to ITFS stations operating on ITFS Channel A1 (2,500–2,506 MHz), and also a BFO interference threat to ITFS receivers operating anywhere in the 2,500–2,586 MHz ITFS band. Since that time a joint and comprehensive "white paper" filing by the Wireless Cable Association International ("WCA"), CTN, and the National ITFS Association ("NIA"), on October 7, 2002, has proposed major revisions to the 2,500–2,690 MHz ITFS/MMDS band. That white paper has now been assigned rulemaking number RM-10586.

9. The band plan proposed in the WCA/CTN/NIA white paper, which would refarm the ITFS/MMDS band into a 66-MHz wide lower band segment ("LBS") with twelve 5.5-MHz wide channels, a 6-MHz wide "J-Band" restricted use band ("RUB"), a mid-band segment ("MBS") with seven 6-MHz wide channels for traditional high-power, "big-stick" ITFS operations, a 6-MHz wide "K band" restricted use band, a 66-MHz wide upper band segment ("UBS") with another twelve 5.5-MHz wide channels, and finally a 4-MHz wide I band. Two-way, cellularized operations using either frequency division duplex ("FDD") or time division duplex ("TDD") technologies would occur

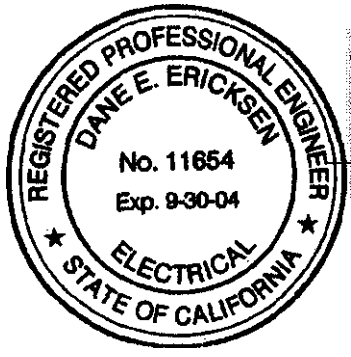
in the LBS and UBS, which, in general, keeps the MBS as a safe harbor for traditional ITFS operations. Low power, secondary **uses** of the J, K, and I bands would also be permitted.

10. The white paper was the result of six months of intensive effort by engineers representing the interests of WCA, CTN, NIA, commercial mobile radio service ("CMRS") operators, and equipment manufacturers providing hardware to the ITFS, MMDS, and CMRS industries (the Technical Rules Revision or TRR Group of WCA). Paramount to the achievement of a consensus white paper document was the realization by all parties that the new band plan must protect from mutual interference the diverse uses of the LBS, UBS, and MBS. To this end, the white paper developed stringent guidelines for both adjacent channel leakage ratios ("ACLRs") and brute force overload ("BFO"). In general, the white paper requires operators in all hand segments to coordinate their designs or, alternatively, to use only equipment with such good performance (*i.e.*, stringent emission masks) that the operation of devices in one band segment will be inherently incapable of causing interference (which is generally defined as more than a 1 dB degradation in the noise floor of the protected device) in another band. These proposed protection protocols recognize the mobile nature of cellular telephones and the itinerant nature of customer premises equipment ("CPE"), and, in general, achieve cross band protection by the use of tighter emission masks rather than reliance on questionable "Monte Carlo" style statistical modeling of the supposed locations of mobile devices or CPEs.

11. It is, therefore, imperative that any new terrestrial MSS operations at **2,483.5–2,500** MHz adopt strict protection requirements to ensure that new two-way, cellularized, digital operations in the LBS and **UBS,** and traditional **ITFS** operations in the MBS, not be degraded by either out-of-band leakage from terrestrial MSS operations or by BFO from high power terrestrial MSS base stations. In general, this should mean that any terrestrial MSS operations, both fixed and mobile, must sufficiently restrict their out-of-band spurious emissions so as to cause no more than a 1 dB degradation in the noise floor of any operations in the LBS, J, MBS, **K, UBS,** or **I** band frequencies, and must recognize that a terrestrial **MSS** operator may need to upgrade the downconverters serving fixed ITFS receive sites to BFO-immune (or at least BFO-tolerant) devices. Because terrestrial MSS will likely desire to build base stations in the very same metro[p;oysm areas that ITFS and MMDS operators now use, extraordinarily stringent spectral masks will be required to ensure no interference occurs to ITFS and MMDS operations.

Summary

12. An ATC for Big LEO **MSS** at 2,483.5–2,500 MHz continues to represent **an** interference threat to existing ITFS operations at 2,500–2,586 MHz, and would also represent an interference threat to the LBS operations proposed in RM-10586. Terrestrial MSS operations at 2,483.5–2,500 MHz would additionally constitute a BFO interference threat to all operations in the now proposed LBS, J, MBS, **K,** UBS, and I bands. Any grant of authority for ATC MSS must therefore include strict interference and BFO protection requirements not only to existing ITFS operations but also to the new operations proposed in RM-10586.



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